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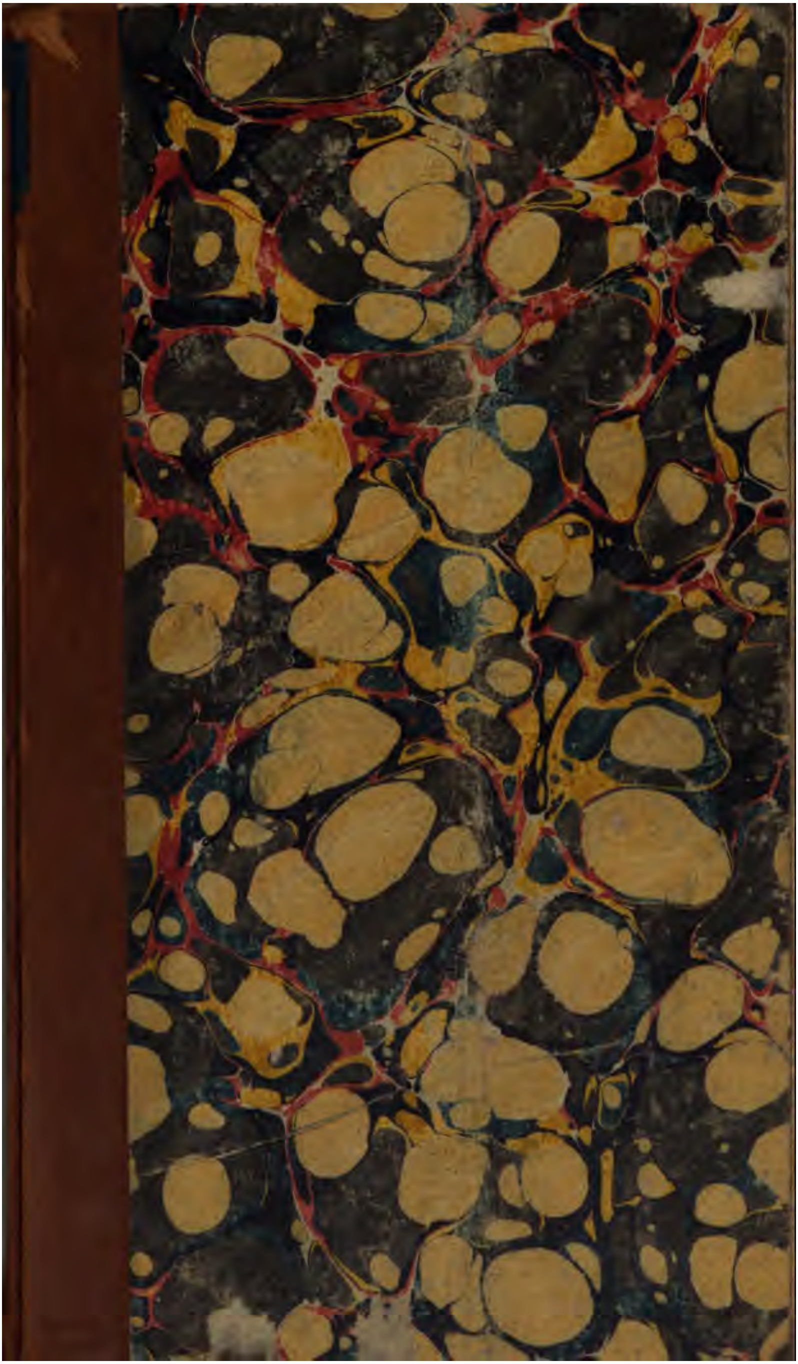

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ON THE

DIVISIONS AND MUTUAL RELATIONS OF KNOWLEDGE.

A LECTURE READ BEFORE THE RUGBY
LITERARY & SCIENTIFIC SOCIETY,

APRIL VII, MDCCCXXXV.

BY

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ON THE

DIVISIONS AND MUTUAL RELATIONS

OF

KNOWLEDGE.

THE subject which I have chosen for this evening's lecture may seem liable to two objections; it may be thought too dry to awaken interest in the minds of the audience, and too difficult to be properly treated without more time and more research than I have been able to devote to it. I am aware that there is some force in both of these objections: but on the other hand there are reasons which have induced me to choose this subject, and which I think will be found to outweigh them.

It happens necessarily in an institution such as ours, that the lectures delivered embrace a great variety of subjects, and that they are given without any order or mutual connection. Different views of the great world of knowledge are thus presented to us: but all are necessarily partial, nor do they tell u how they are to be joined on to one another, in order to convey a just notion of the whole. Even an imperfect attempt therefore to show the connection or relation between them, seemed to me to be better than nothing; that we may understand what is the value of the several branches of knowledge, as helping to make up the great sum of human wisdom; and may also see, which is a point of no small importance, what sort of knowledge it is which particularly entitles its possessor to be called a well educated man.

Now even this slight statement of the object of this lecture shows that we are going to venture on an inquiry of a very high order, inasmuch as it embraces not the subjects of any one or more of the sciences, but the nature and merits of those very sciences themselves. This sovereign investigation, in which the mind may be said to exert the very fulness of its power, examining at once the world of outward things and its own faculties and operations, standing apart as it were from all things visible and invisible, and as if by a mere abstract power of observation, looking at once above and below, around and within itself, this it is which is properly called Philosophy.

First then, with a subject before us so extensive and so various, it will be necessary to break it up into certain divisions, that our minds may be able to comprehend it. This process of philosophical division admits of very considerable variety. We are not to suppose that there are only a certain number of divisions in any subject, and that unless we follow these, we shall divide it wrongly and unsuccessfully: on the contrary every subject is as it were all joints, it will divide wherever we choose to strike it, and therefore according to our particular object at different times we shall see fit to divide it very differently. For instance let us suppose that our subject be the vegetable creation; we shall see that this subject is divided differently, according to our different objects in studying it. If we consider vegetables only with reference to the uses which man can derive from them, we should divide them first into such as are useful to him directly, and such as are not: and the former again we should divide into such as are useful for food, such as are useful for clothing, and such as minister to our various wants in other ways. But in this division we should class some vegetables together which on another view of the subject we should find it necessary to separate, and separate others which on another view of the subject we should be obliged to class together. For instance on the view of the subject already noticed, we should class wheat, and the potatoe, and the grape, and the fig, under one division, that of vegetables useful for man's food; and should of course separate them from such plants as are incapable of being applied to the same purpose. But if we consider vegetables without any reference to man, and merely according to the differences or resemblances in their own structure, in other words if we consider them botanically, the wheat, the potatoe, the grape, and the fig, notwithstanding their common usefulness, are immediately separated from one another; the wheat is classed along with the grasses which feed our cattle, the potatoe and the vine are ranked with the nightshade and the henbane, and the fig is placed in the same division as the ash tree.

Bearing this in mind, we shall see that the various branches of human knowledge are capable of the most different arrangements according to the light in which we wish to regard them. Bacon for instance makes a threefold division of them, which he derives from a similar division of the powers or operations of the human mind, into the memory, the imagination, and the reason. Accordingly he divides all knowledge into history, poetry, and science or philosophy; the first belonging to the memory, the second to the imagination, and the third to the reason. Another division has been adopted in a work still in the course of publication, the Encyclopædia Metropolitana; a division of which the author was, I believe, the late Mr. Coleridge. He first divides all science into pure and mixed. By pure science he means such as is conversant merely with the acts of the mind in itself, by mixed science that which considers these acts in connection with the outward world. The pure sciences again he divides into formal and real; under the first of which he places grammar, logic, arithmetic, and geometry; under the second are ranged metaphysics, morals, and theology. I am aware that this brief statement must be obscure; but my object in making it is to illustrate the truth, that human knowledge may be divided variously according to the purpose of the divider; and I wished to draw attention to the division into formal and real science, for I shall have occasion to make use of these terms hereafter, and shall then attemp to explain them.

For my present object, which is to give such a division as may be most readily and generally understood, I know not that I could adopt a better method than to divide our knowledge into such as relates to man, and such as relates to other objects of what kind soever, animate or inanimate. But when I speak of man, I mean that part of him which is peculiar to himself, namely, his intellectual and moral nature. For the study of his mere bodily frame, or of the phenomena of his physical life, is but a small part of one great whole, of which by far the greatest part relates to objects distinct from himself, and therefore the study may generally be classed more properly with those which relate to external things. Thus the knowledge which relates to man would naturally include every thing relating to his double nature, as a being having an understanding, and a moral part which we may call for convenience a spirit. Thus it would in the first place embrace the study of his mind; the analysis of its faculties and ideas, which is metaphysics; the analysis of the processes of his reason, which is logic; and the analysis of language, the instrument which he necessarily employs in these processes, which is grammar. Secondly, it would embrace the study of his moral nature; the analysis of his feelings and affections; which like that of the faculties of his understanding may be classed under metaphysics; and the analysis of his duties. This last, so long as his duties towards God are not understood, is the part of ethics or morals: but as soon as we are acquainted with God, and with our relations to Him, all our duties, whether towards God or man, are properly to be classed under one name, that of religion; because it is manifest that all our duties to other men are duties to God, and that whatever we ought to do is our duty for this very reason, because it is the will of God that we should do it.

Besides the study of man's nature in general, knowledge relating to man would also embrace a knowledge of the actions, characters, and fortunes, of particular parts of mankind, whether larger or smaller. Under this head are to be ranked History with all its subdivisions, and Biography.

Then turning to the other great division of human knowledge, the knowledge that relates to all other objects besides ourselves; here too the one vast whole thus presented to our imaginations may be broken up into various parts. It will include Natural History in its widest sense, including not only the animal and vegetable kingdoms, but the mineral also, and even the earth itself. But when we speak of the history of animals and plants we must remember that here history is wholly distinct from biography. Amongst creatures without reason, whether animate or inanimate, one individual is like another; history with them regards only the species. Nor is chronology much more connected with them than biography; for the oak and the lion of the present day are the same, so far as we can discover, as the oak and the lion of the first year of the world's existence. Time has only wrought changes in some few cases, through the agency of man, as in the change effected in particular vegetables by cultivation, and perhaps in one or two instances in animals also, by the attention bestowed on improving the breed. With the history of the earth on the contrary chronology is every thing. Here there are constant changes working, altering the limits of land and water, and in some instances, where volcanic agency is busy, or where particular phenomena of wind and soil are combined, actually altering the character of the land, as well as lessening or increasing its limits. But still in all history there is this common point that its principal business is to describe facts as they are or have been, rather than to enter into causes or general principles. And thus the natural historian looks as it were but on the outward edifice of nature: it belongs to other branches of knowledge to penetrate within the sanctuary.

It will be obvious that what is most needed for Natural History is careful observation. If we want to know more of an animal than we can collect from one simple view of it we must examine it more carefully; and watch its habits for a considerable time together. Thus the very amusing account which Huber has given us of bees was the result of constantly watching them; so that he made himself as it were an eye witness of the whole life of the animal. So again in Geography, which is the history of the surface of the earth. All that is wanted in order to draw a map of a country is to bestow sufficient pains on surveying it; it is a long book which takes a great deal of time to read, but still all the information is to be found in the book, if we have but patience to read it through. But we want to do more than this with nature, we want not only to see what she is, but to understand how and why she is so, that we may be able ourselves to form her or reform her for our own purposes. Water, and air, and light, are things which the most ignorant of us enjoy; but not all understand them. The sky with its hosts of stars must strike every one as beautiful, but to how few is there more of order apparent in that bright multitude, or regularity in their movements, than in the wild dance of a swarm of fireflies. Thus on every side above us and around us there are materials not for observation only but for thought and reasoning; we may not only mark and learn the visible result produced by God's working, but observe the laws by which He works, that here too we may after our most imperfect measure learn to work like Him.

In ascending then from Natural History to Natural Philosophy the first laws that would be enquired into would be those of a most obvious as well as most extensive class of phenomena, the phenomena of Motion. I use this term in its widest sense, as embracing the motions of the heavenly bodies no less than of earthly, as including the motion of fluids, such as air and water, as well as of solids. With regard to the heavenly bodies their movements were indeed almost the only point in which human science could study them. The laws which preside over these movements formed the greatest part of the inquiries of Astronomy; as the laws which direct the movements of earthly bodies, were in the case of solids, the subject of Mechanics; and in the case of fluids, the subject of Hydrostatics, Pneumatics, and Optics. In all these instances there is this point in common; that we are considering those laws which act upon bodies from without, and produce in them a change of place only, and not of quality. We are therefore still, if I may so speak, at the outside of things, examining their movement only, and not their composition. It is possible however to go farther than this, and to examine another class of phenomena, those namely in which bodies are found to change not their place only but their quality, a change evidently of a deeper kind, and belonging to causes of a different character. And here we come to those studies in which such great progress has been made in our own generation. Electricity, with its kindred subjects Magnetism and Galvanism, and Chemistry. How little progress had been made till a very recent period in the examination of the nature of bodies as opposed to their movement, may be well understood from this fact, that in the popular works on science which were in circulation in our own childhood, fire, air, earth, and water, were still represented as the four elements of the universe. To what point the inquiry into these subjects may be carried hereafter, it seems impossible to anticipate: the doctrine of atoms appears indeed to be bringing us to the very elements of physical existence; while the study of the phenomena of Electricity, of Magnetism, and above all of what is called Animal Magnetism, seems to promise that in the course of years, or it may be of centuries, we may arrive at some glimpses of a yet higher mystery, the relations of physical and moral existence towards each other, and the principle of animate life.

The study of external nature then, that is of all things existing except ourselves, seems to divide itself first of all into two great divisions, History and Science: by the first of which I mean a mere record or description of facts or existing phenomena in the natural world, whether animate or inanimate; while by the second, I understand an inquiry into the laws or causes by which these phenomena are regulated. But Science again admits of a double division, inasmuch as its inquiries may either regard the movements of bodies, or their component parts and qualities; that is to speak generally it may consider them as affected mechanically or chemically. So then the divisions of all our knowledge of nature may be said to be three, Natural History, Mechanical Science, and Chemical Science, using all these terms for convenience's sake in a sense rather wider than that which they bear in common language.

It would seem then that the range of Natural Knowledge is sufficiently extensive, and its subjects sufficiently sublime. To soar to the utmost limits of visible space, to measure the movements of the host of heaven, and on the other side to penetrate into the subtlest laws of being, and to analyse matter up to its very original elements, might surely be enough to vindicate the dignity of the study of nature. But the Greek Philosophers exalted it yet further, by making it ascend not only to the purest forms of physical existence, but higher still, to the nature of God Himself. And undoubtedly according to that grand division of all knowledge which I have adopted, the knowledge of man on the one hand, and of all other objects except man on the other, the knowledge of God might seem to take its place fitly as the last ascent of natural philosophy, and so the study of nature might infinitely transcend in dignity the study of man. But I would request your attention to this point, as it will be the foundation of all I have to say on the remaining part of my subject, the relations namely of the different divisions of our knowledge to one another, I request attention to this great truth, that God considered in this point of view, as the summit of the scale of existence, as the most exalted of all beings, and therefore in Himself the noblest object of knowledge, that God regarded in this manner is wholly beyond our reach, unapproachable and incomprehensible. No doubt He is the head as well as the author of all being; the fit completion of the pyramid of the knowledge of the universe is that it should end in that point of perfection of unity, the One Great Cause of all. But this pyramid is like that unfinished tower of Babel; its top never can reach to God. It stands for ever manifestly incomplete, yet incapable of being completed; for the power which reared all the rest of the fabric can neither find nor lay in its place that last and crowning stone. God thus hiding Himself altogether from the sight of Natural Knowledge, reveals Himself only as a part, if I may so speak, of our knowledge of Man; first as the fountain of all our duties, and so the perfection not of our natural knowledge but of our moral; and secondly in that great truth of the Christian Revelation, that as man alone he is to be known, or is in any way comprehensible.

We thus remove the centre of all our system from the division of Natural Knowledge to that of Moral; and thus our view of the relations of the different branches to one another becomes greatly modified. That is, we get to regard all science, whether natural or moral, as a matter of duty rather than of simple knowledge: the knowledge being in all cases referable to a farther end, that is, our duty in compliance with God's will. For as on the one hand it is possible to regard all moral questions as a matter of simple science, inquiring into the actions and fortunes of man, and analysing his passions and faculties and duties purely for the sake of speculative truth, as if we were the inhabitants of another planet; so it is no less possible to regard all physical knowledge as a matter of practice; studying the phenomena, and inquiring into the laws of irrational and inanimate bodies not for the mere intellectual pleasure of discovering truth, but because the discovery of truth is more or less our duty according to the nature of our calling, for the benefit of others directly or indirectly, or for the improvement of our own powers of mind, that so we may act our part in life more efficiently.

And thus while we see that no knowledge whatever is to be despised, and while we rejoice in the cultivation of all science of whatever kind, we yet cannot but perceive also, that thus looking upon all nature as ministering in a manner to man, and the knowledge of it as valuable because it ministers to his happiness, if other knowledge ministers to his happiness more, and more universally, then that knowledge must be deemed as yet more valuable than the knowledge of nature, and the possession of it must be considered essential to perfect education.

This is universally understood with regard to what is called religious knowledge, which every one allows to be beyond dispute the most valuable of all. It will be my object here to show that it is true also of those studies to which Coleridge gives the name of the pure sciences, and which he divides, as I have said before, into those which he calls formal and real.

The pure sciences are all engaged either with mind, or with the operations, or with the ideas and abstractions of the mind; none of them have to do with real material nature. Now the human mind may fitly be called that great and universal machine by which we operate upon all things. We all know the fame which was so deservedly obtained by the late Mr. James Watt, for his great improvements in the steam engine. The value of the steam engine consists not only in the magnitude of its powers, but in the generality of their application. It is useful not for one purpose only but for hundreds. How different are the callings of the cotton manufacturer, the brewer, and the packet master or coach proprietor; yet steam serves the purposes of them all. Now if the steam engine be so general an instrument, the human mind is yet more so. Nothing absolutely can be done without it, and who can set bounds to what may be done with it? In improving then this universal engine we are conferring a service on mankind something the same in kind with the improvement of the steam engine, but in degree and extent of usefulness beyond all comparison greater.

Unhappily however there has either been no James Watt to perfect this mightier engine; or his directions have been despised or neglected; or mind being less manageable than iron and steam, the engine has refused to be moulded according to the model proposed for its improvement. For it is notorious that minds of equal natural power are most unequal in their practical efficiency, and that many persons with considerable talents and favourable opportunities are unable to avail themselves of either to any good purpose, because the cultivation of their mind has been wholly neglected. Now the mind is a universal instrument through its reasoning powers, its judgment, and its power of rapid and extensive combination. By the reasoning powers I understand the faculty of coming to a true conclusion from premises or data which are undisputed; the power of making the most of our materials of knowledge. As a familiar and most admirable example of this I may refer to the Elements of Euclid: all that we set out with in this case are three simple postulates, or things required to be granted; and from these three are drawn by the strictest process of reasoning all that variety of truths respecting the properties of triangles, circles, &c. which fill a whole volume. Now all these truths are really contained in the postulates, axioms, and definitions of the two first pages; yet how few persons would have been able to discover and to prove them. This has been done by the power of reasoning; the power, that is, of finding out all the truths which lie hidden in any facts or principles presented to us, and of avoiding false conclusions; that is, the supposing certain truths to be contained in our principles which really do not exist in them. A good reasoner then is he who draws from the data, or premises, or evidence before him, all that may justly be drawn from them, and nothing which may not.

Now as the human mind is eager to gain fresh knowledge, positive faults in reasoning have been quite as common as negative; that is, men have come to wrong conclusions quite as often as they have failed to discover all the right ones. This evil, of positively bad reasoning, of concluding what cannot be justly concluded, arises from a want of a due acquaintance with the instrument necessarily used in every process of reasoning, namely language. And hence appears the importance of those two studies which teach us to analyse language, logic and grammar. Language is indeed a wonderful instrument, but the very facility of using it with a certain degree of effect, for we all talk and occasionally argue, is apt to conceal from us the difficulty of acquiring a perfect command of it. We constantly find persons both speaking and writing vaguely: using words in different senses, or in no well defined sense at all, without being aware of it: and as never having analysed the process of correct reasoning, arguing in a manner at random, and supposing that to be a proof, or an answer to an objection, which in reality is not so. These are faults for which the study of grammar and of logic is the appropriate remedy. In both we take language to pieces, examine its structure, and learn to appreciate and recognise those defects to which it is most liable. In logic especially we learn what may be called the skeleton of reasoning, that simple form which however concealed under the more ornamental form of our common style of talking or writing, as the actual skeleton is concealed by our flesh, can never be really departed from without involving a fallacy. Knowing this skeleton accurately, we can in an instant feel even through the covering, the flesh, so to speak, of our ordinary language, whether all the bones are in their right places, nay we know where to suspect disorder, and by passing our probe at once to the suspected part, we can see whether or no all is sound. These suspicious parts in reasoning to speak generally, are first what may be called the joint of the argument, the point of connection between the premises and the conclusion, and secondly any abstract terms which are found to occur often in the reasoning. For men's notions about such terms being often indistinct, it happens that they do not always use them in the same sense, and thus may deceive both others and themselves by a word's imperceptibly shifting its meaning in the course of their argument, and a thing in reality different being thus passed off as the same.

Logic and Grammar then as putting us on our guard against the fallacies of language, are the great means of cultivating our reasoning powers. And they are called formal sciences, as opposed to real, because they treat not of any particular thing or matter, but of those forms of speech and of reasoning which apply equally to all matter; they are moulds into which we may put any material that we will, but without which none whatever can be shaped properly.

Such are the studies which the mind requires to perfect its reasoning powers; that is, the powers by which it unfolds truth already acquired and recognised. All reasoning must set out from some fixed point supposed to be true; and its business is to see what other hidden truths may be developed from the truth so granted or assumed. Unhappily however the mind is not only liable to error in this process, but the supposed truth itself which is the foundation of our reasoning may have been assumed unjustly: we may be wrong in the stating of the sum as well as in the working of it. But here no formal science will be sufficient for us: for though there is one common form for all reasoning, yet things themselves are so infinitely various, and their truth is collected in so many different ways, that no one rule can be applicable to all. The judgment therefore, that power of the mind by which we take cognizance of truth, and transmit it, having stamped upon it our sanction, to our reasoning powers to coin as it were into other truths, can only be probably guided, not infallibly secured from error. But how is this guidance to be given it? How is this task, which most peculiarly deserves the name of education, to be accomplished? What is that great preparation which can dispose the mind, amidst the delusions with which we are surrounded, to fix on truth with a sure instinct, and to avoid error?

Error, according to Bacon's comparison, may originate in ourselves, or without us: outward objects may not communicate a faithful image to us, or our own minds like a broken or uneven mirror may distort the image presented to them. Truth may not be to be found, or we may be in no fit condition to receive it.

What then are the hindrances in our own minds to receiving truth? Bacon divides them into three principal classes, which he calls the spectres or phantoms of the race, of the den, and of the market place. The fancifulness of these names is characteristic of the man: but their meaning is not the less admirable. The phantoms of the race are those prejudices or tendencies to error which are common to the whole race of mankind; the phantoms of the den are those which grow out of the peculiar weakness of each man's individual mind: and those of the market place are such as arise from our communication with other men, from the vaguenesses and ambiguities of language.

With the last kind we have no concern, as they have been noticed before. The other two demand the greatest attention, but my limits will not allow me to do more than just to point out their importance. Among the common errors of our race may be noticed 1st, that bondage of our minds to our senses, by which the visible and the present always prevails over the invisible and the absent; that great moral corruption which the scripture calls unbelief: 2nd, that craving after general truths or principles, which makes us form theories hastily, upon insufficient evidence, and without noticing what makes against them: and 3rd, the abuse of a principle most true in itself, that truth and goodness are identical; a principle which becomes the fruitful parent of error, when setting up blindly and imperfectly our own standard of goodness we will allow nothing to be true which seems to us to contradict it. These three, the spirit of unbelief, the spirit of impatience, and the spirit of bigotry, are common to all mankind, and we are all more or less affected by them.—

Not less important to notice are the phantoms of the den, the tendencies of each man's individual constitution of mind. For example how great are the differences between men, according as imagination or observation has most power over them. This difference separates the man of feeling and sentiment from the man of fact and reality; the poet from the man of science; the idealist school of philosophy from the sensualist: the admirer of names and associations from the lover of positive rights; the fanatic from the sceptic. How apt are these two classes to sneer at and rail against one another; to tax each other with folly and with hardness and low mindedness! How earnestly should we labour, if our imagination and feelings be predominant, to steady and sober them with the love of fact and reason and justice; or if observation and reasoning be our natural tendency, how heartily should we strive to soften and ennoble them by admiration, and love of the beautiful, and faith in the invisible.

These instances, for I can but just allude to them, will show the discipline which our own minds require, to clear them from the common erroneous tendencies of our nature, as well as from those which infest ourselves individually. But whilst thus making the mirror of our own minds even and pure to receive the image of truth when presented to us; there is a farther difficulty still, in extricating that form entire and unsoiled from the mass of confusion and error in which it so often lies buried. There is in the first place the difficulty of getting at the truth of facts; then at the truth of opinions; and again there is the great question whether the truth of any opinion be eternal or only temporary; for it may be that a doctrine may be very true as applied to one time or place, which would be very false as applied to another. Thirdly there is the comparison of truths, which in practice is every thing; when two statements of principle are alike true in themselves, but are not both practically true with regard to us; because the less of two good things becomes a positive evil if we follow it to the neglect of the better; as for instance a doctrine may be perfectly true as far as regards political economy, but not true as regards the happiness of a people speaking morally and religiously. Here then comes in the comparison of truths: for the economical truth becomes a practical falsehood if we follow it to the neglect of the moral truth. Let us observe then how many things are required for the perfecting of this great faculty of the mind, the judgment of truth, with which we are now concerned. To ascertain the truth of facts requires a knowledge of the laws of evidence; what makes a testimony credible, and what makes it suspicious. To estimate the value of opinions requires, over and above our knowledge of human nature in general, a particular knowledge of the effect which circumstances have upon men's opinions, circumstances whether of time or country. For instance it has often been made a question whether the opinions of ancient or modern times are entitled to most respect; now this question setting aside its ridiculous vagueness, might even if asked with regard to any two definite periods, require a different answer according to the different opinions about which the dispute turned: for it is very possible that the opinion of one age might be most valuable on one point, and that of another upon another. Again to know whether an opinion is true generally or partially, requires in itself no slight acquaintance both with the distinguishing characteristics of eternal and partial truth, and with the circumstances of different times and countries, and the bearings of those circumstances upon the truth in question: for a truth may be only local or temporary, and yet may apply to two countries or to two periods differing in many respects from one another, but not in those particular respects which affect the application of the truth to their case. Further the comparison of truths renders it necessary that our standard of duty and of good should be clearly settled; that knowing what is the highest truth, and what the subordinate and inferior, we may never follow that lower good, which when opposed to the higher, becomes evil.

Besides the reasoning powers and the judgment I spoke of the power of rapid and extensive combination, as one of the things which enabled the mind to be an universal instrument. Perhaps strictly speaking I ought not to give it a distinct place, for it is in many cases essential towards forming a sound judgment: but its great importance may justify me in bestowing some separate notice upon it. We live in a world so varied, that without this power of combination our views must be exceedingly narrow, or exceedingly confused. They must be narrow, if confining ourselves to one class of subjects and of relations, we understand them indeed in themselves thoroughly, so far as they can be understood thoroughly without considering them as acting or acted on by other things, but are wholly ignorant of all others; they must be confused, if studying variously, and receiving ideas from many different sources we let them lie confusedly upon one another, without arranging them into one great whole. The power of combination may be said to consist in a quick perception of likeness: in two different subjects we discern some one point bearing a resemblance to a common third: we group them together, and then notice their disagreements as well as their agreements. And this goes on continually with a multiplied power; for the more ideas we have thus grouped together in our minds, the more points are offered to which some new idea may attach itself; as in a child's card sheep fold, the more cards you add, the more you multiply points on which to join fresh cards still. This power of combination is most essential to the profitable reading of history, for unless we combine the lessons afforded by the story of one age or country with those afforded by that of others, our recollection of one will confuse that of the others, they will probably be all imperfectly remembered, and most certainly all will be imperfectly understood.

If any of my hearers be surprised at the great number of elements thus required to perfect the human mind as an instrument, (for all that I have been saying has borne on this point only; I have spoken nothing of any particular knowledge as useful to ourselves or others, except as far as regards its bearings on the powers of the mind;) let them learn to think more highly than men commonly do think of the full meaning of the term education, and let them not over estimate the value of the attempts that are now making in various ways to give information to the people, including such institutions as this of ours. Simple knowledge of any the humblest trade may enable us to be useful to others, to maintain our families, and if it be followed as our appointed line of duty, to glorify God. But considered as instruction, as information, as in short an intellectual acquisition, the value of the knowledge communicated, be it of chemistry, be it of astronomy, be it of geography, be it of history, depends on the powers and on the education of the receiving mind. Knowledge is the material for the mind to work upon; but if the instrument be blunt or out of order, what avails the fineness of the material? it continues stuff unwrought and useless. Further we shall have seen that education in the proper sense of the word cannot be given equally to a great number of persons. You may teach them the formal sciences indeed equally, so that their reasoning powers may be cultivated alike; but you cannot do the same with their judgment or their power of combination. For the judgment depending greatly on a knowledge of men, and the power of combination increasing with the number of ideas presented to it, they who by circumstances are confined to a limited sphere, who see little variety, who have never associated with many highly cultivated minds, and above all with minds cultivated under different circumstances of rank, profession, and country, must labour under disadvantages which no mere book instruction can remove. But at the same time it is important to see how much mere book instruction can do, if it be applied wisely. If we read the works of great men, philosophers, or orators, poets, historians, or divines, the works of great men, whose own views are large and profound, whose minds have combined actively a great variety of ideas, and beautifully expressed them; and if we read them with our minds alive and awake to catch and to understand, we are not only, as has been often remarked, in a better society than is easily to be found amongst living men, but we gain a far wider and truer experience of men and of things than is gained oftentimes by a whole life of active intercourse with what is called the world. And not to speak of foreign writers, what a treasure of wisdom and of experience is to be gained from the works of Bacon, his Essays and his Advancement of Learning; from the conversation of Johnson as recorded by Boswell, far more indeed than from his writings; from the Aids to Reflection, and the Literary Remains of Coleridge, from the Sermons of Butler; from the poetry of Milton and of Shakespeare. Only let us read with a mind attentive and enquiring; let us for instance always acquaint ourselves with the age in which the writer lived, with something of the circumstances of his life and the peculiarities of his character. And when I speak of the age in which he lived, I do not speak of a knowledge of a mere date, which is good for nothing; as for instance that Bacon was born in 1560, and died in 1626; but an idea of what that period was, what events Bacon saw, and with what men he held intercourse, how remote from, or how like to our own. An inquiring spirit is not a presumptuous one, but the very contrary: He whose whole recorded life was intended to be our perfect example is described as gaining instruction in the temple by hearing and asking questions: the one is almost useless without the other. We should ask questions of our book and of ourselves; what is its purpose; by what means it proceeds to effect that purpose: whether we fully understand the one, whether we go along with the other Do the arguments satisfy us, do the descriptions convey lively and distinct images to us; do we understand all the allusions to persons or things? in short does our mind act over again from the writer's guidance what his acted before; do we reason as he reasoned, conceive as he conceived, think and feel as he thought and felt; or if not, can we discern where and how far we do not, and can we tell why we do not?

And now in conclusion, if the mind be thus cultivated and exercised, we stand as it were on the edge of the great garden of knowledge, free to turn on which path we choose, with an instrument of surpassing power to make any portion of it yield its fruits for our nourishment and enjoyment. Happily indeed the choice is fixed for most of us, our calling in life decides for us the particular branch of knowledge, whether physical or moral, which we are most required to study. And inclination or accidental circumstances may farther suggest such branches as we may choose to study besides, in such hours of leisure as we can command. Only it is clear that in whatever it is our duty to act those matters also it is our duty to study; there are many things of which we must all be ignorant, many of which we may be ignorant because there are other studies which we prefer to follow: but there are two things of which, unless we wholly go out of the world, we may not be ignorant without great blame, our duties as men and as citizens. And thus the very matters which concern us most nearly, are exactly those on which the rules of this and other similar institutions forbid us to enter. I do not dispute the expediency of these rules; or to speak more correctly their necessity in the present state of party feeling, both religious and political: but so long as they are observed it is idle to call Mechanics' Institutes places of adult education. Physical science alone can never make a man educated; even the formal sciences invaluable as they are with respect to the discipline of the reasoning powers, cannot instruct the judgment; it is only moral and religious knowledge which can accomplish this. And if habitually removing such knowledge from the course of our studies, we exercise our thoughts and understanding exclusively on lower matters, what will be the result but that when we come to act upon these higher points, in our relations as citizens and as men, we shall act merely upon ignorance, prejudice, and passion? For notions of moral good and evil of some sort or other we must have; and so also in this country we can hardly help having some notions about political good and evil; but if we take no pains that these notions shall be true and good, what will our lives be but a heap of folly and of sin? This should be borne in mind carefully; and if these merely scientific or literary institutions appear to us to be sufficient for our instruction, if having learnt all that they can teach us, the knowledge so gained shall hide from us our moral ignorance, and make us look upon ourselves as educated men, then they will be more than inefficient, or incomplete; they will have been to us positively mischievous. But if we are well aware of their deficiences, and take them only at their real value, they may furnish us with some knowledge that may be of use to us in our several callings, and they may undoubtedly give us some innocent and wholesome recreation. They may do more than this however, if they encourage in us habits of unimpassioned inquiry; if they make us hold commune with our minds, and teach us to feel the difference between understanding a subject and not understanding it. In this manner they may prepare us for the study of those higher matters on which they themselves do not enter; they may make us feel our ignorance where we are ignorant, and the vagueness of our notions where they are vague: they may thus preserve us from presumption on the one hand, and yet by stimulating the desire of knowledge, may save us from an idolatrous leaning upon human authority on the other; so helping to cherish a state of mind at once docile and enquiring, which best becomes us both as men and as christians.

THE END.

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I have been induced to publish this Lecture in consequence of the efforts which have been lately made by the Society for the Diffusion of Useful Knowledge, to organize the several Mechanic's Institutions now existing throughout the kingdom, and to encourage the establishment of others. The Society has also published a Manual, containing amongst other things a Catalogue of Books recommended as fit for such Institutions and for Apprentice's Libraries: and this Manual is farther submitted to "the friends of adult education," as being intended to promote their great object. Wishing most earnestly to serve the cause of "adult education," and feeling that while it was desirable on the one hand to encourage Mechanic's Institutions on account of the good which they can do, it was no less important to call attention to their necessary imperfections, and to notice that great good which they cannot do, I have thought that the following Lecture might be generally useful, if printed in its original form, as it was actually addressed to the members of the Institution of Rugby. Only a very few corrections and alterations have been made in it, for I did not wish to give it a more pretending character than belonged to it as it was originally written.

Rugby, September, 1839.